

REMARKS

In the Office Action, the Examiner objected to the specification. The specification is amended to correct the noted informalities. The correction to page 4, line 27 uses "about" instead of "approximately."

The Examiner objected to claims 8 and 9. The correction to claim 8 is not being made. The "in addition to" is a "parameter" in addition to another "parameter." "Within" a parameter does not work. The correction to claim 9 is made, but with modification to the group language. "Or" is not intended to be exclusive.

Claims 1-17 were rejected pursuant to 35 U.S.C. § 103(a) as unpatentable over Robinson, et al. (U.S. Patent No. 6,582,367) in view of Hossack, et al. (U.S. Patent No. 5,873,830). Claims 18-29 were rejected pursuant to 35 U.S.C. § 103(a) as unpatentable over Robinson, et al. in view of Hossack, et al., and further in view of Smith, et al. (U.S. Patent No. 6,241,675).

Applicants respectfully request reconsideration of the rejections of claims 1-29, including independent claims 1, 11, 18 and 27.

Independent claim 1 recites scanning a two-dimensional plane over a first lateral range and scanning a three-dimensional volume over a second lateral range less than the first lateral range. Robinson, et al. and Hossack, et al., do not disclose these limitations.

As noted by the Examiner (page 3 of the Office Action dated October 15, 2007), Robinson, et al. do not disclose different lateral ranges for the 2D and 3D scans.

Hossack, et al. also do not disclose different lateral ranges for 2D and 3D or even different scan types. Hossack, et al. improve spatial characteristics within a region of an image (col. 2, lines 31-34; and col. 5, lines 40-53). A same 2D plane corresponding to the images is divided into two portions shown together as an image of the 2D plane (col. 2, lines 35-44; and col. 5, lines 54-65). Hossack, et al. change parameters within a same 2D plane, not different lateral extent for scans of different types, namely 2D and 3D.

Both Hossack, et al. and Robinson, et al. do not disclose different lateral extent in a 2D plane and a 3D volume. Extending the teaching of Hossack, et al. to different types of scan regions is hindsight. The 2D region is not a region of interest of the 3D scan, and the 3D volume is not a region of interest of the 2D scan. Furthermore, Hossack, et al. teach different

parameters to vary, but does not ever include lateral extent as a parameter to be varied (col. 2, lines 45-52).

The Examiner alleges the volume scan must be limited in lateral extent as compound to the 3D scan due to time considerations. This is not true. Robinson, et al. teach 2D and 3D regions with the same lateral extent (Figures 11 and 12). Hossack, et al. note frame rate, persistence and interpolation or techniques to change temporal temporal resolution (col. 2, line 66 – col. 3, line 26). A person of ordinary skill would have used these techniques, not different lateral extent.

Independent claim 11 recites similar limitations, so is allowable for the same reasons.

Dependent claims 2-10 and 12-17 depend from claims 1 and 11, so are allowable for the same reasons. Further limitations patentably distinguish from the cited references.

Claim 4 recites a perpendicular lateral range. Hossack, et al. do not disclose different ranges for different scan types (2D and 3D).

Claims 5 and 13 recite images with different lateral extent. As discussed above, a person of ordinary skill in the art would not have provided different lateral scans. The images also would not be different.

Claims 6 and 14 recite 2D B-mode and 3D Doppler. The cited portion of Robinson, et al. describes tissue and vasculature. Vasculature is a tissue structure. Since the 3D scan is used to survey, there is no Doppler 3D.

Claim 8 recites two scans with different values for a parameter in addition to lateral extent. Hossack, et al. show different parameter values for different portions of a same image, not different images and not different types of scans. A person of ordinary skill would have used the different values for different portions of the 2D images, but would not have used the different values for the different types of scans.

Claims 9, 10 and 16 are allowable for the same reasons as claim 8.

Independent claim 18 recites scanning a volume at a lower resolution and scanning as sub-volume at a higher resolution. The combination of teachings of Robinson et al., Hossock, et al., and Smith, et al. would not have provided these limitations.

Robinson, et al. and Hossack, et al. would not have been used together as discussed above for claim 1.

If Smith et al. were used with Robinson, et al. and Hossack, et al., the resolution of the sub-volume would not be different. Hossack, et al. teach spatial and temporal variation (col. 2, line 30 – col. 3, line s 26). Smith, et al. note temporal speed (col. 2, lines 1-3). A person of ordinary skill in the art would have used the parameter adjustments of Hossack, et al. for speed. Hossack, et al. use inter-frame interpolation, differences in persistence, and increasing relative frame rate (col. 2, lines 66 – col. 3, line 26). A person of ordinary skill in the art would not have used a different resolution since Smith, et al. note speed and Hossack, et al. increase speed without increasing resolution.

The Examiner alleges obviousness to distinguish fine detail from course detail. High resolution is needed to show fine detail. Regional separation of resolution only allows distinction of fine and coarse details in the high resolution region. The low resolution region does not show fine detail. Given the obviousness reason of the Examiner, the entire volume would be high resolution to better distinguish fine and coarse detail.

Similarly, a clearer view is provided by high resolution for the entire volume.

Independent claim 27 is allowable for the same reasons as claim 18.

Dependent claims 19-16, and 28-29 depend form claims 18 and 27, so are allowable for the same reasons. Further limitations patentably distinguish from the cited references.

Claims 20-22 are allowable for the same reasons as claim 1.

CONCLUSION

Applicants respectfully submit that all of the pending claims are in condition for allowance and seeks early allowance thereof. If for any reason, the Examiner is unable to allow the application but believes that an interview would be helpful to resolve any issues, he is respectfully requested to call Craig Summerfield at (312) 321-4726.

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Respectfully submitted,



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